High-pH News

Vol. 1 No. 1 April 15, 2002

Letter from the 'Editor'-

Greetings! Welcome to the inaugural edition of the High-pH (HIP) News.

The purpose of this newsletter is to provide a mechanism for sharing information and establishing professional relations among scientists and regulators with interests in high-pH geochemical settings. The newsletter is an outgrowth of conversations that I have had with many of you as I muddled my way along the path to understanding the effects of slag drainage on the environment. These conversations frequently provided springboards to for discussions in different but related (by high-pH geochemistry) settings and applications.

An (Acid) Mine Drainage Interest Group and newsletter has existed within the USGS for several years and was a logical outgrowth of extensive work done in that field during the latter part of the last century. Work in high-pH settings has a similarly established history but because there has not been an analogue to the Federal programs that served to clean-up abandoned mine sites, there has not been the same focused approach to research and publication. From my conversations with many of you, there does seem to be a growing interest in high-pH settings and related degradation of the environment. Hopefully, the timing is right for the introduction and utilization of this newsletter.

In email and telephone discussions with some of you, there has been an expression of interest in 'natural' as well as anthropogenically created high-pH settings – non-point as well as point-source situations. My own tunnel vision and concerns with research in anthropogenically created settings almost caused me to overlook the naturally occurring and non-point source high-pH settings. I'm looking forward to expanding my knowledge with regard to those topics and I hope it is acceptable to everyone included on this email list to include all high-pH environments.

I'm committed to sending out a fresh newsletter 2-4 times per year. The scheduling will of course depend largely on the amount of information that I receive from each of you. I would appreciate receiving (1) Topics for Consideration, (2) Recently Released Literature, (3) Meeting and Training Announcements, (4) Equipment News, (5) Opportunities to Work Together, (6) HIP Scientist Profiles, and (7) Open Forum discussions. At some point I'd like to release the name, title, affiliation, address and phone number of all persons receiving this newsletter; if you would prefer that your personal information were not circulated, please let me know.

Thank you for your interest in this newsletter. I hope that we can all benefit from the information and associations shared by through its existence. Please send information that can be included under any of the titles below. I will organize the information and send out the news, but I need your help to make this a truly worthwhile experience.

Randy Bayless

Contents

Topics for Consideration

Acetylene Waste
Algal Blooms
Biological Processes
Cement Kiln Operations
Concrete Recycling
Concrete Washing Operations
Construction Waste
Field Operations
Flue-Gas Desulfurization By-Products
Iron and Steel Slag
Laboratory Activities
Utilization of High-pH Materials

(Please submit topics that you feel should be considered.)

Recently Released Literature

1. Savage, D., Noyb, D. and Miharac, M., 2002, Modelling the interaction of bentonite with hyperalkaline fluids. Applied Geochemistry, v. 17, issue 3, p. 207-223.

   Numerical models were used to examine the sequential changes in mineralogy and porosity that accompanied the juxtapositioning of cement and bentonite barriers. Results indicated that hyperalkaline fluids generated by the interaction of ground water and cement penetrated up to 60 cm of bentonite after approximately 1 ka. Porosity increased to 90 percent in the 2 cm nearest the interface. In general, porosity increases away from the interface were compensated by the precipitation of more stable secondary minerals.

2. Schneider, A., 2002, Caustic dust blankets World Trade Center area. St. Louis Post-Dispatch, February 9, 2002. [courtesy T.K. Greeman]

   This article describes the results of testing done on dust in Manhattan in the wake of the World Trade Center disaster. The pH values on most of 36 samples were 9.5 to 10.5, but some were as high as 12.1. The caustic dust is attributed to pulverized cement. The article discusses adverse health effects being realized in citizens, emergency and clean-up workers.

3. Qian, G; Sun, DD; Tay, JH, 2001, New aluminium-rich alkali slag matrix with clay minerals for immobilizing simulated radioactive Sr and Cs waste. Journal of Nuclear Materials, p.199-204. [courtesy M.S. Schulz]

4. Leccese, M, 2001, From Slag Heap to Urban Chic A slag heap is reborn as a new urbanist community in Pittsburgh. Landscape Architecture, v. 91, no. 10, p. 52-59. [courtesy M.S. Schulz]

Oldies but Goodies

1. Roadcap, G.S. and W.R. Kelly, 1994, Shallow ground-water quality and hydrogeology of the Lake Calumet area, Chicago, Illinois – Interim Report for the Illinois Department of Energy and Natural Resources and the United States Environmental Protection Agency: Illinois State Water Survey, May 1994. 64 p.

   This document describes water quality and mineral speciation in a slag-effected area of northeastern Illinois.

2. Kay, R.T., T.K. Greeman, R.F. Duwelius, R.B. King, J.E. Nazimek, and D.M. Petrovski, 1997, Characterization of fill deposits in the Calumet region of northwestern Indiana and northeastern Illinois: U.S. Geological Survey, Water-Resources Investigations Report 96-4126, 36 p. 3 plates.

   This report describes the history of fill operations in northeastern Illinois and northwestern Indiana – the fill is largely comprised of steel and iron-making slag. Plates show the thickness and date-of-emplacement of fill in the study area.

Meeting and Training Announcements

April 22 – 26, 2002 USGS/NTC – Concepts in Aquatic Ecology

April 29 – May 10, 2002 USGS/NTC - Field Water-Quality Methods for Ground-Water and Surface-Water

Equipment News

Question: Has anyone looked into the effect of high-pH fluids on the decomposition of commonly-used Si-based filters?

Question: We commonly have pH=10 buffers on hand for calibrating field pH meters. Does anyone have information on commercially available buffers for higher pH values? Does anyone have recipes for stable buffers for higher pH values?

Opportunities to Work Together

HIP Scientist Profiles

Open Forum

(Please contribute any information that you feel would create interesting/spirited discussion amongst the newsgroup recipients.)